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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/742,126

12/19/2003

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31647 7590 03/04/2008

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EXAMINER

DUONG, THANH P

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

03/04/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

DETAILED ACTION

Applicant's remarks and amendments filed on November 13, 2007 have been carefully considered. Claims 29, 39, 50, 51, 52, 53, 61, 66, 87, and 88 have been amended. Claim 38, 60, 62-65, 89, and 92-93 have been canceled. Claims 29-37, 39-59, 61, 66-88, 90, and 91 are pending in this application.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 29-36, 39-40, 43-48, 66-74, 76-78, 82-85, 88, and 90-91 are rejected under 35 U.S.C. 102(b) as being anticipated by Bartz et al. (5,510,093). Regarding claims 29-32, 38-39, 43-45, 66-68, 76-78, 82-85, 88, and 90-91, Bartz et al. '093 discloses a two-stage reactor for removing pollutants from gaseous streams, the two-stage reactor (Fig. 3) comprising: a) an upper thermal reaction chamber (30) comprising: i) an outer exterior wall; ii) an interior porous wall (39), wherein the interior porous wall defines a central chamber (31), and wherein the interior porous wall is positioned from the outer exterior wall a sufficient distance to define an interior space (Fig. 3); iii) at least one waste gas inlet in fluid (42) communication with the central chamber for introducing a gaseous waste stream therein; iv) a fuel inlet (44) for introduction of a fuel gas for mixing with the gaseous waste stream (via 42); v) an oxidant inlet (40) for introduction of an oxidant for mixing with the gaseous waste

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stream; vi) thermal means for forming reaction products (combustion zone 31) from the gaseous waste stream; and vii) means for introducing a fluid (Col. 5, lines 1-14) into the interior space (via 40), wherein the interior porous wall provides for transference of the fluid from the interior space into the central chamber at a sufficient force to reduce deposition of reaction products on the interior porous wall; and b) a lower reaction chamber (50) comprising: i) a gas flow chamber (50) in fluid communication with the central chamber comprising an inlet and outlet for passing the gaseous waste stream and reaction products therethrough; and ii) means for generating a downwardly flowing liquid film (liquid overflow) on interior surfaces of the gas flow chamber thereby reducing deposition (Col. 5, lines 25-47) and accumulation of particulate solids thereon.

Regarding claims 33 and 69, Bartz et al. '093 discloses at least one fluid (via 40) is introduced thru the interior space and the recitation of "introducing a fluid into the interior space is adapted to introduce water" is directed to the contents thereof during an intended operation and does not impart further structural limitation to the claimed invention. See *Ex Parte Thibault*, 164 USPQ 666, 667, (Bd. App. 1969); therefore, Bartz continues to read on the apparatus of the claimed invention. Regarding claims 34-36, 47-48, and 70-74, the recitation of introducing "fluid into the interior space under pulsing conditions or periodic condition" and "operating pressure" does not further limit structural limitation to the claim; therefore, Bartz et al. continues to read on the apparatus of the claimed invention. Furthermore, such recitations are directed to the manner of operating the device. Note, the manner of operating a disclosed device nor material or article worked upon further limit an apparatus claim. Said limitations do not

differentiate apparatus claims from prior art. See MPEP 2114 and 2115. Further, the examiner notes that process limitations do not have patentable weight in an apparatus claim. See *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969) that states (Expressions relating the apparatus to contents thereof and to an intended operation are no significance in determining patentability of the apparatus claim." Regarding claim 40, Bartz et al. discloses a means (via 52) for introducing a fluid tangentially into the interior space to create a vortex fluid. Regarding claim 46, Bartz et al. discloses the porous ceramic wall which inherently comprises of apertures for passage of pressurized gas thru the porous ceramic wall. With respect to claim 88, Bartz et al. discloses the porous ceramic wall with the same structural features as the claimed invention; therefore, the porous ceramic wall is capable of providing the fluid into the central chamber and reducing backflow of any fluid or reaction products from the central chamber.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 41-42, 49, 75, and 79-81 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bartz et al. '093. Regarding claims 41-42, Bartz et al. discloses the liquid vortex (via 52) is introduced to the concentric chamber (chamber between cooling

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column 50 and annular trough 51) with baffle (upper portion of 50) and the liquid overflow the interior surface of the concentric chamber (Col. 5, lines 30-46). With respect to the "conical-shaped baffle," the shape of the baffle is not considered to confer patentability to the claim. It would have been an obvious matter of engineering choice to select an appropriate shape for the baffle, such as the one having conical shape on the basis of its suitability for the intended use as a matter of obvious engineering choice and since such a modification would have involved a mere change in the shape of a component. A change in shape is generally recognized as being within the level of ordinary skill in the art, absence showing any unexpected results. *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966). Regarding claim 49, Bartz et al. '093 discloses the porous wall with apertures and it would have been obvious matter of engineering choice to provide various shapes of the apertures including conical shaped protuberances since it has been held in the art that a change in shape is within the level of ordinary skill in the art. Regarding claims 75, 79, 80, 81, the apparatus of Bartz et al. is substantially the same as that of the instant claims, but is silent as to whether there may be more than one inlet. However, it would have been obvious to one having ordinary skill in the art to provide more than one inlet to facilitate in mixing the fluids in the apparatus of Bartz since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

3. Claims 37, 50-59, 61, and 86-87 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bartz et al. '093 in view of Ping-Chung et al. (6,187,080). Regarding

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claims 37 and 50-53, 55, 61, 86, 87, Bartz et al. '093 discloses an abatement system for removing pollutants from gaseous streams, the two-stage reactor (Fig. 3) comprising: a) an upper thermal reaction chamber (30) comprising: i) an outer exterior wall; ii) an interior porous wall (39), wherein the interior porous wall defines a central chamber (31), and wherein the interior porous wall is positioned from the outer exterior wall a sufficient distance to define an interior space (Fig. 3); iii) at least one waste gas inlet in fluid (42,44) communication with the central chamber for introducing a gaseous waste stream therein; iv) thermal means for forming reaction products (combustion zone 31) from the gaseous waste stream; and v) means for introducing a fluid (Col. 5, lines 1-14) into the interior space (via 40), wherein the interior porous wall provides for transference of the fluid from the interior space into the central chamber at a sufficient force to reduce deposition of reaction products on the interior porous wall; vi) at least one fuel inlet (44) for introduction of a fuel gas for mixing with the gaseous waste stream (via 42); vii) at least one oxidant inlet (40) for introduction of an oxidant for mixing with the gaseous waste stream; and b) a lower reaction chamber (50) comprising: i) a gas flow chamber (50) in fluid communication with the central chamber comprising an inlet and outlet for passing the gaseous waste stream and reaction products therethrough; and ii) means for generating a downwardly flowing liquid film (liquid overflow) on interior surfaces of the gas flow chamber thereby reducing deposition (Col. 5, lines 25-47) and accumulation of particulate solids thereon. Bartz fails to disclose a lower reaction chamber with includes at least one oxidant inlet positioned to introduce an oxidant to the gas flow chamber. Ping-Chung et al. '080 teaches it is desirable to provide a gas vortex

means 37 or oxidant in the lower chamber to minimize waste powder or solid deposition at the outlet 122. Thus, it would have been obvious in view of Ping-Chung et al. '080 to one having ordinary skill in the art to modify the apparatus of Bartz et al. with at least one oxidant as taught by Ping-Chung et al. in order to minimize solid deposition in the outlet of the upper reaction chamber. Bartz et al. also essentially discloses the features of the claimed invention except a lower reaction chamber includes a liquid vortex. Ping-Chung et al. teaches it is desirable to provide a liquid vortex 38 in the lower reaction chamber to minimize waste powder or solid deposition at the outlet 122. Thus, it would have been obvious in view of Ping-Chung et al. '080 to one having ordinary skill in the art to modify the apparatus of Bartz et al. with a liquid vortex as taught by Ping-Chung et al. in order to minimize solid deposition in the outlet reaction chamber. With respect to the "conical-shaped baffle," the shape of the baffle is not considered to confer patentability to the claim. It would have been an obvious matter of engineering choice to select an appropriate shape for the baffle, such as the one having conical shape on the basis of its suitability for the intended use as a matter of obvious engineering choice and since such a modification would have involved a mere change in the shape of a component. A change in shape is generally recognized as being within the level of ordinary skill in the art, absence showing any unexpected results. *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966). Regarding claim 54, the specific porosity of the interior wall is not considered to confer patentability to the claim. The precise porosity of the interior porous wall would have been considered a result effective variable by one having ordinary skill in the art. As such, without more, the claimed porosity of the

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interior porous wall cannot be considered be "critical". Accordingly, one having ordinary skill in the art would have routinely selected an appropriate type of interior porous wall with an appropriate porosity, such as the one taught by Bartz et al., so as to optimize the flame temperature for the interior porous wall. (*In re Boesch*, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980)), and since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (*In re Aller*, 105 USPQ 233). Regarding claim 56-58, Bartz et al. '093 discloses at least one fluid (via 40) is introduced thru the interior space and the recitation of "introducing a fluid into the interior space is adapted to introduce water " is directed to the contents thereof during an intended operation and does not impart further structural limitation to the claimed invention. See *Ex Parte Thibault*, 164 USPQ 666, 667, (Bd. App. 1969); therefore, Bartz continues to read on the apparatus of the claimed invention. Regarding claim 59, the recitation of introducing "fluid into the interior space under pulsing conditions or periodic condition" and "operating pressure" does not further limit structural limitation to the claim; therefore, Bartz et al. continues to read on the apparatus of the claimed invention. Furthermore, such recitations are directed to the manner of operating the device. Note, the manner of operating a disclosed device nor material or article worked upon further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP 2114 and 2115. Further, the examiner notes that process limitations do not have patentable weight in an apparatus claim. See *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969) that states (Expressions relating the apparatus to contents thereof and to an

intended operation are no significance in determining patentability of the apparatus claim.

Response to Arguments

Applicant's arguments filed November 13, 2007 have been fully considered but they are not persuasive.

Note, Bartz et al. discloses the “a fuel inlet (44) for introduction of a fuel gas for mixing with the gaseous waste stream (via 42); v) an oxidant inlet (40) for introduction of an oxidant for mixing with the gaseous waste stream”. Bartz et al. also discloses the porous ceramic wall with the same structural features as the claimed invention; therefore, the porous ceramic wall is capable of providing the fluid into the central chamber and reducing backflow of any fluid or reaction products from the central chamber.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TOM P. DUONG whose telephone number is (571)272-2794. The examiner can normally be reached on 8:00AM - 4:30PM (IFP).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tom P Duong/
Examiner, Art Unit 1797

/Glenn A Caldarola/
Acting SPE of Art Unit 1797